PELAGIC FISH INVESTIGATIONS

The pelagic fishes, such as the tuna, mackerel, round herring, swordfish and many others, require quite different methods of investigation than the demersal species and are accordingly put into a separate research investigation.

Our pelagic fisheries, especially that of the mackerel, have received little attention of late, due primarily to the lack of any substantial fishery (exception herring) in this area. The mackerel fishery has suffered an extreme decline but with changing environmental changes may once again become an important New England fishery. Studies on this fish should be started as soon as possible so that we may be in a position to document these changes and to evaluate management measures. The physical act of studying the mackerel will make it possible to concomitantly investigate the biology of all other important pelagic species on the continental shelf.

The tuna fishery is becoming a real possibility off New England and the basic biological facts concerning this species need prompt attention. Of paramount importance now is further knowledge concerning the origin, distribution, and abundance of this fish.

August 6, 1959

PELAGIC FISH INVESTIGATION

List of Projects

Mackerel

1. Tagging and migration
2. Seasonal variations in adipose eyelid
3. Morphometric studies
4. Aging techniques
5. Age and growth
6. Seasonal distribution
7. Mortality (natural)
8. Biostatistics

Bluefin Tuna

9. Validation of aging techniques
10. Age and growth of Atlantic bluefin
11. Distribution and abundance (North of Hatteras)
12. Relation of environment to distribution
13. Food of Northwest Atlantic bluefin

Other Pelagic Species

14. Distribution and abundance of round herring
15. Biology of alewives (support to R. I.)

SUMMARY CO' OL SCHEDULE

Investigation: Pelagic Fish
Biological Laboratory: Woods Hole, Mass.

Project Title	Est.* Cost	Fiscal Years 57	58	59	60	61	62	63	64	65	66
Mackerel											
1. Tagging and migration	33.6	--	--	--	--	7.0	7.0	5.5	1.9	6.1	6.1
2. Seasonal variations in adipose eyelid	7.0	--	--	--	--	2.7	1.4	1.9	1.0	--	--
3. Morphometric studies	16.3	--	--	--	--	--	--	2.2	1.9	6.1	6.1
4. Aging techniques	3.9	--	--	--	--	2.7	1.2	--	--	--	--
5. Age and growth	7.7	--	--	--	--	2.7	1.2	2.2	1.6	--	--
6. Seasonal distribution	25.7	--	--	--	--	--	--	5.5	6.6	6.7	6.9
7. Mortality (natural)	9.6	--	--	--	--	--	--	1.7	1.6	2.9	3.4
8. Biostatistics	12.7	--	--	--	--	2.0	1.3	1.6	1.6	2.9	3.3
Bluefin Tuna											
9. Validation of aging techniques	1.1	--	--	--	--	--	1.1	--	--	--	--
10. Age and growth of Atlantic bluefin	19.0	--	--	--	--	--	7.0	5.0	7.0	--	--
11. Distribution and abundance (North of Hatteras)	27.6	--	--	--	--	--	6.5	6.5	8.6	6.0	--
12. Relation of environment to distribution	31.6	--	--	--	--	--	--	6.5	8.6	7.0	9.5
13. Food of Northwest Atlantic bluefin	26.0	--	--	--	--	--	--	5.5	6.7	6.8	7.0
Other pelagic species											
14. Distribution and abundance of round herring	9.8	--	--	--	--	--	1.2	1.6	1.3	2.5	3.2
15. Biology of alewives (support to R.I.)	8.1	--	--	--	--	6.5	1.6	--	--	--	--
Investigation Total	239.7	--	--	--	--	23.6	29.5	45.7	48.4	47.0	45.5

Annual Review

Laboratory	Regional or Area Office	Washington Office

Prepared by: R. L. Edwards — Date 8/6/59

Recommended by: — Date

Lab. Director Herbert W. Graham — 8/6/59

Reg. or Area Dir. Joseph A. Director

Branch Chief

Approved by:

Division Chief for Director

*Total needed by Laboratory for Project in thousands of dollars.

#714 7/9/59

must be delayed Pending funds and personnel.

U. S. Fish and Wildlife Service
Bureau of Commercial Fisheries

Sheet No. 1

Location: Woods Hole, Mass.
Date: August 6, 1959
File No.

Research Project Outline

Title of Project: Mackerel-tagging and migration

Investigation Title: Pelagic fish

Investigation Chief: Vacant

Project Leader: Vacant
Name Title Grade

Assistants: (Title and Grade)

Collaborators:

Need for Information: Altho once one of the biggest fisheries in New England, research on this fishery never truely solved the problems of mackerel migration and particularly that of their winter range.

Objective: To determine seasonal migratory patterns.

Method of Procedure:

Phase 1: Development of satisfactory tag and analysis of tag returns followed by corroborative research vessel cruises.

Phase 2:

Pelagic Fish 1
Sheet No. 2

File No.:

Method of Procedure: (Cont'd)

Phase 3:

Estimated Costs: Total Needed by Laboratory for Complete Project 33.6

	FY 1959	FY 1960	FY 1961
Personal Services	---	---	1.0
Other Expenses: Within Project	---	---	1.0
	---	---	[illegible]
Lab. Adm. & Ser.	---	---	5.0
Lab. Total			7.0
Regional Office			.07
Washington Office			
Total			

Recommended Source of Funds S-K and Regular
(S-K, Regular, Contributed, etc.)

Estimated Date of Completion: Phase 1 FY 61; Phase 2 FY ; Phase 3 FY ; Project FY 66

Recommended by:		Date
Originator	R. L. Edwards	8/6/59
Investigation Chief	R. L. Edwards	8/6/59
Laboratory Director	Herbert W. Graham	8/6/59
Regional Director	[signature]	8/19/59
Branch Chief		
Approved by: Division Chief for Director		

Remarks

(Continue on reverse side)

Must be delayed pending funds & personnel.
[illegible]

#715 7/9/59

U. S. Fish and Wildlife Service
Bureau of Commercial Fisheries

Sheet No. 1

Location: Woods Hole, Mass.
Date: August 6, 1959
File No.

Research Project Outline

Title of Project: Seasonal variations in adipose eyelid

Investigation Title: Pelagic fishes

Investigation Chief: Vacant

Project Leader: Vacant
Name Title Grade

Assistants: (Title and Grade)

Collaborators:

Need for Information: The mackerel is still a "mystery" fish in that is seasonal habits are apparently peculiar. The adipose eyelid undergoes marked seasonal variations in development. An understanding of these changes and their functional meaning may help to explain seasonal changes in behavior.

Objective: To determine seasonal changes in structure and function of the adipose eyelid.

Method of Procedure:

Phase 1: Critical examination of appropriate biological material - structurally and histologically.

Phase 2:

Pelagic Fish 2
Sheet No. 2 File No.:

Method of Procedure: (Cont'd)

Phase 3:

Estimated Costs: Total Needed by Laboratory for Complete Project 7.0

	FY 1959	FY 1960	FY 1961
Personal Services	---	---	0.5
Other Expenses:			
Within Project	---	---	0.2
	---	---	---
Lab. Adm. & Ser.	---	---	2.0
Lab. Total	---	---	2.7
Regional Office			.027
Washington Office			
Total			

Recommended Source of Funds S-K and Regular
(S-K, Regular, Contributed, etc.)

Estimated Date of Completion: Phase 1 FY 61; Phase 2 FY ; Phase 3 FY ; Project FY64

Recommended by:
Originator R.L.Edwards Date 8/6/59
Investigation Chief R. L. Edwards 8/6/59
Laboratory Director Herbert W. Graham 8/6/59
Regional Director Joseph T. Pruitt 8/19/59
Branch Chief
Approved by:
Division Chief for Director

Remarks

(Continue on reverse side)

Project to be dropped pending funds and personnel

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U. S. Fish and Wildlife Service
Bureau of Commercial Fisheries

Sheet No. 1

Location: Woods Hole, Mass.
Date: August 6, 1959
File No.

Research Project Outline

Title of Project: Mackerel-ageing techniques

Investigation Title: Pelagic fish

Investigation Chief: Vacant

Project Leader: Vacant
Name — Title — Grade

Assistants: (Title and Grade)

Collaborators:

Need for Information: The mackerel, when abundant, had a marked cycle of abundance. Although, the causes of these fluctuations were never adequately described, it would not have been possible to evaluate any possible effects of environmental change, etc., had they been defined without a knowledge of the age and growth parameters of the mackerel.

Objective: To develop adequate ageing techniques.

Method of Procedure:

Phase 1: Analysis of cyclic structure of fin rays and other parts to determine best ageing techniques.

Phase 2: Validation of technique.

Pelagic Fish 4
Sheet No. 2

File No.:

Method of Procedure: (Cont'd)

Phase 3:

Estimated Costs: Total Needed by Laboratory for Complete Project 3.9

	FY 1959	FY 1960	FY 1961
Personal Services	---	---	0.5
Other Expenses:			
Within Project	---	---	0.2
	---	---	---
Lab. Adm. & Ser.	---	---	2.0
Lab. Total	---	---	2.7
Regional Office			.027
Washington Office			
Total			

Recommended Source of Funds S-K and Regular
(S-K, Regular, Contributed, etc.)

Estimated Date of Completion: Phase 1 FY 61; Phase 2 FY ; Phase 3 FY ; Project FY 62

Recommended by: Date

Originator	R. L. Edwards	8/6/59
Investigation Chief	R. L. Edwards	8/6/59
Laboratory Director	Herbert W. Graham	8/6/59
Regional Director	Joseph F. Puncochar	8/19/59
Branch Chief		

Approved by:
Division Chief for Director

Remarks

(Continue on reverse side)

[illegible]

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U. S. Fish and Wildlife Service
Bureau of Commercial Fisheries

Sheet No. 1

Location: Woods Hole, Mass.
Date: August 6, 1959
File No.

Research Project Outline

Title of Project: Age and growth of mackerel

Investigation Title: Pelagic fish

Investigation Chief: Vacant

Project Leader: Vacant
Name Title Grade

Assistants: (Title and Grade)

Collaborators:

Need for Information: Population estimate studies required adequate age and growth data. Growth rate data also required in order to assess management proposals, particularly should this fish ever again enter the fishery in its former abundance and develop as well its former cyclic nature.

Objective: To determine growth rates and their variations.

Method of Procedure:

Phase 1: Using fin ray or other validated technique, prepare an adequate body of data on the age and growth.

Phase 2:

Pelagic Fish 5
Sheet No. 2 File No.:

Method of Procedure: (Cont'd)

Phase 3:

Estimated Costs: Total Needed by Laboratory for Complete Project 7.7

	FY 1959	FY 1960	FY 1961
Personal Services	---	---	0.5
Other Expenses:			
Within Project	---	---	0.2
	---	---	---
Lab. Adm. & Ser.	---	---	2.0
Lab. Total	---	---	2.7
Regional Office			.027
Washington Office			
Total			

Recommended Source of Funds S-K and Regular
(S-K, Regular, Contributed, etc.)

Estimated Date of Completion: Phase 1 FY 61; Phase 2 FY ; Phase 3 FY ; Project FY 64

Recommended by: Date

Originator R.L.Edwards 8/6/59

Investigation Chief R. L. Edwards 8/6/59

Laboratory Director Herbert W. Graham 8/6/59

Regional Director Joseph G. Peterson 8/19/59

Branch Chief

Approved by:

Division Chief for Director

Remarks

(Continue on reverse side)

Project is delayed pending funds of personnel

#715 7/9/59

U. S. Fish and Wildlife Service
Bureau of Commercial Fisheries

Sheet No. 1

Location: Woods Hole, Mass.
Date: August 6, 1959
File No.

Research Project Outline

Title of Project: Mackerel biostatistics

Investigation Title: Pelagic fishes

Investigation Chief: Vacant

Project Leader: Vacant
Name Title Grade

Assistants: (Title and Grade)

Collaborators:

Need for Information: A consistent body of catch data is prerequisite to any population dynamics study.

Objective: To prepare biostatistical report.

Method of Procedure:

Phase 1: Analysis and compilation of catch and research vessel data bearing on abundance, distribution and age composition.

Phase 2:

Pelagic Fish 8
Sheet No. 2

File No.:

Method of Procedure: (Cont'd)

Phase 3:

Estimated Costs: Total Needed by Laboratory for Complete Project 12.7

	FY 1959	FY 1960	FY 1961
Personal Services	---	---	0.5
Other Expenses:			
Within Project	---	---	0.2
	---	---	---
Lab. Adm. & Ser.	---	---	1.3
Lab. Total	---	---	2.0
Regional Office			.02
Washington Office			
Total			

Recommended Source of Funds S-K and Regular
(S-K, Regular, Contributed, etc.)

Estimated Date of Completion: Phase 1 FY 61; Phase 2 FY ; Phase 3 FY ; Project FY 66

Recommended by:

		Date
Originator	R. L. Edwards	8/6/59
Investigation Chief	R. L. Edwards	8/6/59
Laboratory Director	Herbert W. Graham	8/6/59
Regional Director	Joseph T. Quinn	8/19/59
Branch Chief		

Approved by:
Division Chief for Director

Remarks

(Continue on reverse side)

Project to be charged pending funds & personnel
[illegible] 8-24-59

#715 7/9/59

U. S. Fish and Wildlife Service
Bureau of Commercial Fisheries

Sheet No. 1

Location: Woods Hole, Mass.
Date: August 6, 1959
File No.

Research Project Outline

Title of Project: Biology of alewifes

Investigation Title: Pelagic fish

Investigation Chief:

Project Leader: R. Cooper, Student Assistant Fishery Aid, GS-5
(Name, Title, Grade)

Assistants: (Title and Grade)

R. L. Edwards, Fishery Research Biologist, GS-12

Collaborators:

Dr. Saul Saila, University of Rhode Island, Marine Laboratory

Need for Information: The alewife contributes more than 30 million pounds per year to the meal industry. The project is designed to encourage and aid research on this fish outside of our Laboratory.

Objective: To increase our knowledge of the alewife.

Method of Procedure:

Phase 1: Research is being done on tagging techniques, association of alewives with particular river systems, racial breakdown, and age and growth.

Phase 2:

Pelagic Fish 15
Sheet No. 2

File No.:

Method of Procedure: (Cont'd)

Phase 3:

Estimated Costs: Total Needed by Laboratory for Complete Project 8.1

	FY 1959	FY 1960	FY 1961
Personal Services	---	---	1.0
Other Expenses:			
Within Project	---	---	0.5
	---	---	---
Lab. Adm. & Ser.	-- --	---	5.0
Lab. Total	---	---	6.5
Regional Office			.065
Washington Office			
Total			

Recommended Source of Funds S-K and Regular
(S-K, Regular, Contributed, etc.)

Estimated Date of Completion: Phase 1 FY 61; Phase 2 FY ; Phase 3 FY ; Project FY 62

Recommended by: Date
Originator R. L. Edwards 8/6/59
Investigation Chief R. L. Edwards 8/6/59
Laboratory Director Herbert W. Graham 8/6/59
Regional Director Joseph F. Puncochar 8/19/59
Branch Chief
Approved by:
Division Chief for Director

Remarks

(Continue on reverse side)

~~Should~~ Must be delayed pending funds & personnel. HWG 12-29-59

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